

1247-0822-0V PCT



IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
Pierre JEANVOINE ET AL : GROUP ART UNIT: 1731
SERIAL NO: 09/381,631 : EXAMINER: S. VINCENT
FILED: MARCH 1, 2000 :
CPA FILED: MAY 23, 2002 :
RCE PERFECTED: HEREWITH :
FOR: METHOD AND DEVICE FOR MELTING AND
REFINING MATERIALS CAPABLE OF
BEING VITRIFIED

APPEAL BRIEF

COMMISSIONER FOR PATENTS
ALEXANDRIA, VA 22313

SIR:

This is an appeal of the Final Rejection dated January 9, 2003 of Claims 38-40, 42-46, 50, 56, 77, 78, 98, 100-106, 115 and 116. A Notice of Appeal, along with a petition for a third-month extension of time, is **submitted herewith**.¹

07/10/2003 AHONDAF1 00000061 09381631

03 FC:1402

320.00 0P

¹An RCE was attempted to be filed on June 5, 2003, accompanied with a two-month extension of time, for consideration of an IDS filed therewith. On June 28, 2003, the Office entered a Notice of Improper Request for Continued Examination (RCE), on the ground that the RCE was not accompanied by a submission as required by 37 CFR 1.114. This Appeal Brief is intended to constitute such submission. A copy of the Notice, as required therein, is **submitted herewith**.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Saint-Gobain Vitrage having an address at 18, Avenue 'Alsace, Courbevoise, France F-92400.

II. RELATED APPEALS AND INTERFERENCES

Appellants, Appellants' legal representative and the assignee are aware of no appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF THE CLAIMS

Claims 38-40, 42-46, 50, 56, 77, 78, 98, 100-106, 115 and 116 stand rejected and are herein appealed. Claims 41, 47-49, 51-55, 57-76, 79-97, 99, and 107-114 the remaining claims in the application, stand withdrawn as being directed to a non-elected invention.

IV. STATUS OF THE AMENDMENTS

No amendment under 37 CFR 1.116 has been filed.

V. SUMMARY OF THE INVENTION

As recited in independent Claim 38, the present invention is a process of manufacturing glass from vitrifiable materials comprising a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise

liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof.

See the specification at page 2, line 30 through page 3, line 3; and page 9, lines 25-27.

VI. ISSUES

Whether Claims 38-40, 42-46, 50, 56, 77, 78, 98, 100-106, 115 and 116 are unpatentable under 35 U.S.C. §103(a) over U.S. 5,615,626 (Floyd et al) in view of U.S. 3,260,587 (Dolf et al)?

VII. GROUPING OF THE CLAIMS

Claims 43-46, 50, 56, 77, 78, 98, 100-106, 115 and 116 each stand or fall separately from Claim 38.

VIII. ARGUMENT

Claims 38-40, 42-46, 50, 56, 77, 78, 98, 100-106, 115 and 116 stand rejected under 35 U.S.C. §103(a) as unpatentable over Floyd et al in view of Dolf et al. That rejection is untenable and should not be sustained.

As recited in active Claim 38, the present invention is a process of manufacturing glass from vitrifiable materials comprising a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise

liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof.

The choice made according to Claim 38 is very advantageous for the whole glass industry. It makes it possible to feed the melting furnace with at least partly organic materials and glass/organic composite materials that were hard to recycle (like windshields or mineral wool with organic binder). This is possible only because the burners are submerged ones. Only those particular burners make it possible to bring the combustibles at their vicinity, below the bath of molten glass. Furthermore, as explained in the specification, the submerged burners generate a lot of convection movements within the bath of molten glass, which makes the permanent renewal of the combustible elements at their vicinity possible. This is very innovating and could not have been imagined with conventional melting furnaces (either those using immersed electrodes and called electrical furnaces or those using burners above the bath of molten glass and sometimes called gas furnaces). This is a completely new use of the technology of the submerged burners (recycling/valorization of composite/waste materials), which renders it more attractive.

Floyd et al disclose a process for disposal of waste materials, including municipal waste such as garbage, industrial wastes, waste materials including rubber and plastics-based materials, and ash waste from municipal waste incinerators and toxic waste incinerators, wherein the waste is charged to a reactor of a top-submerged lancing injector reactor system, containing a molten slag bath maintained in a turbulent condition during charging of the waste by top-submerged injection therein of a free-oxygen containing gas, using at least one top-submerged lance of the system. The waste is taken into the molten bath and is caused to circulate therein to a combustion/oxidation zone generated by the top-submerged injection. Constituents of the waste are subjected to free-oxygen of the injected gas in that zone and to

heat energy of the slag, and thereby combusted/oxidized and/or decomposed. See the Abstract thereof. In addition, Floyd et al disclose that while the waste is being combusted in the reactor, the slag may be maintained at a temperature of from about 1100°C to 1800°C (column 3, lines 34-36 and column 6, lines 3-10). Floyd et al disclose further that rather than simply producing an ash residue as in existing processes, the process of their invention forms a slag product which, being a glassy phase, essentially encapsulates any ash produced and retains in solid solution any heavy metals which are not able to form a fume (column 7, lines 44-48). As disclosed at column 10, lines 45-48, Floyd et al is concerned with substantially complete combustion/oxidation of waste charged to their reactor.

Floyd et al neither disclose nor suggest the presently-claimed invention. The slag of Floyd et al acts, in essence, as a vehicle for the substantially completely combusted/oxidized waste therein. In the presently-claimed invention, while some combustion necessarily may occur due to the presence of combustible elements, nevertheless, the most-desired components of the vitrifiable materials, such as glass, are melted, not combusted. Floyd et al's apparatus is essentially an incinerator, not a melting chamber. One of Appellants' main goals herein is the ability to recycle vitrifiable materials such as glazings. Clearly, such recycle could not be achieved with the process of Floyd et al.

The Examiner finds that Floyd et al's municipal waste would include various "glazings." In reply, municipal waste would include just about anything, but since glass materials are not even listed in Floyd et al, Floyd et al contemplates relatively small amounts thereof at best. One skilled in the art would not look to Floyd et al to solve a problem regarding recovering vitrifiable materials, such as glazings.

Dolf et al is relied on for a disclosure of submerged combustion methods and apparatus. Particularly, the Examiner relies on the disclosure in Dolf et al of a glass melting

furnace with submerged gas burners, as a reason for why one skilled in the art would use the process of Floyd et al to produce a glass product. Dolf et al does not remedy the above-discussed deficiencies in Floyd et al.

Indeed, it is not clear why one skilled in the art would combine Floyd et al and Dolf et al. As discussed above, Floyd et al require that their waste be at least substantially completely combusted/oxidized. Melting the vitrifiable waste in Floyd et al without substantially completely combusting/oxidizing it, would frustrate Floyd et al's goals. In addition, the result would be Floyd et al's molten slag with molten vitrifiable materials of the waste. It is not clear that this product would have any value in producing recycled vitrifiable waste therefrom. Indeed, the final slag has a very small volume compared to the total mass of waste treated (column 8, lines 42-44). Figure 1 of Floyd et al shows that the treated mass is very porous and that gases easily circulate throughout the treated mass; the slag contains encapsulated ash and its state is not well-defined. Clearly, one skilled in the art interested in manufacturing glass would not carry out Floyd et al as any of the steps.

In the Final Office Action, the Examiner ignores most of the above arguments, and responds to only those which he believes support his case. None do.

At paragraph 12 thereof, the Examiner finds that Floyd et al discloses "slag or flux constitute vitrifiable materials," pointing to column 6, lines 50-60, and the table in column 13 thereof.

In reply, the above-disclosure in Floyd et al regarding slag does not rebut any of Appellants' arguments. Appellants have already acknowledged that Floyd et al discloses their slag product as a "glassy phase." But the only use for this product disclosed by Floyd et al is as a building material or for disposal for landfill (column 6, lines 58-60; column 13, lines 18-

22). That slag is a “glassy” byproduct is not suggestive of anything with regard to manufacturing glass.

Nor does Floyd et al pertain to glass recycling, as the Examiner suggests in paragraph 13 of the Final Office Action, and as rebutted by the above-discussed passage from Floyd et al with regard to building materials and landfills. The only disclosure of recycle in Floyd et al is “at least some slag can be recycled to the reactor as low-energy feed stock for controlling the bath temperature” (column 6, lines 55-56), clearly not something one would recycle glass for.

Regarding the Examiner’s response at paragraph 14 of the Final Office Action to Appellants’ arguments that there is no suggestion or motivation to combine Floyd et al and Dolf et al, the Examiner finds that their respective methods are “almost identical,” and that it would have been obvious to combine them because “[Dolf et al] taught that [Floyd et al]’s process had the ability to produce glass products. In the alternative, it would have also been obvious to combine [Floyd et al] with [Dolf et al] because [Floyd et al] taught that combustible matter in the feed materials would have acted as extra fuel for the melting of the non-combustible matter.”

In reply, Dolf et al is more than thirty years older than Floyd et al, so Dolf et al could not have taught anything about Floyd et al’s process. Secondly, Dolf et al is concerned with the ability to melt glass in large quantities in a relatively small area, in order to produce glass that is free from seeds and bubbles (column 1, line 10ff). Dolf et al’s goal is to ensure that all of the ingredients will be melted before they reach the fining tank, thus contributing to its life (column 3, lines 31-35). Again, without the present disclosure as a guide, it is not clear why one skilled in the art would combine a process for disposing municipal and industrial wastes with a process for melting glass.

In response to Appellants' argument that Floyd et al is not concerned with melting waste, the Examiner, at paragraph 15 of the Final Office Action, notes Floyd et al's disclosure at column 8, lines 6-25 that some of the waste is combusted or "simply dissolved into the slag bath."

In reply, the disclosure in Floyd et al at column 8, lines 6-25, relied on by the Examiner, relates to other particulate fillers present in rubber and plastics material that are "depending on their composition, simply dissolved in the slag bath." However, Floyd et al discloses nothing else with regard to such other particulate fillers. Indeed, Floyd et al seems most concerned about those fillers that combust (column 2, lines 52-64). At any rate, Floyd et al's ultimate goal is substantially complete combustion or oxidation, not melting, as pointed out above.

The Examiner has not considered any of the dependent claims separately. Some are separately patentable, as listed above, for the following reasons.

Claim 43 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 38, wherein the melting of the vitrifiable materials takes place in at least one melting chamber which is equipped with burners passing through its side walls or passing through the floor wall or suspended from the roof or from superstructures, or any combination of sidewalls, floor and roof, so that combustion regions of said burners or combustion gases develop in the mass of vitrifiable materials being melted. Neither Floyd et al and Dolf et al show such an arrangement.

Claim 44 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 38, wherein the combustion regions created by combustion of the combustible mixture or gaseous products resulting from

combustion of the combustible mixture convectively stir the vitrifiable materials. Neither Floyd et al and Dolf et al show such convection.

Claim 45 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 43, wherein the height of the mass of vitrifiable materials in the melting chamber and the height at which the combustion regions or gases resulting from the combustion develop, are adjusted so that the said gases remain within the mass of said vitrifiable materials. Neither Floyd et al and Dolf et al show such arrangement, especially such adjustment.

Claim 46 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 38, wherein the melting is preceded by a step of preheating the vitrifiable materials to at most 900°C. Neither Floyd et al and Dolf et al show no such preheating.

Claim 50 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 38, wherein the melting is carried out at 1400°C at most. Neither Floyd et al and Dolf et al show maintaining melting at or below this temperature.

Claim 56 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 43, wherein all or some of the vitrifiable materials are introduced into the melting chamber below the level of the mass of vitrifiable materials being melted. Neither Floyd et al and Dolf et al show such introduction.

Claim 77 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 39, wherein the combustible elements are composite materials comprising glass and plastic, and which are laminated

glazing or mineral fibers with organic binders. Neither Floyd et al and Dolf et al show such materials.

Claim 78 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 40, wherein the composite materials comprising glass and metal are at least one of glazing with metallic coating, glazing with enamel coating, and glazing with electrical connecting means. Neither Floyd et al and Dolf et al show such materials.

Claim 98 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the product obtained by the process of claim 38. Neither Floyd et al and Dolf et al show such a product.

Claim 100 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 38, comprising additional steps, whereby said glass is manufactured. Neither Floyd et al and Dolf et al show additional steps.

Claim 101 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 100, wherein the glass is flat glass. Neither Floyd et al and Dolf et al show such glass.

Claim 102 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 101, wherein the flat glass has a residual blue color and a solar-protection or fire-resistance function. Neither Floyd et al and Dolf et al show such glass.

Claim 103 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 100, wherein the glass is in the form of a bottle or a flask. Neither Floyd et al and Dolf et al show such glass.

Claim 104 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 100, wherein the glass is glass wool or glass fiber. Neither Floyd et al and Dolf et al show such glass.

Claim 105 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest a process of recycling metal/glass or plastic/glass composite materials comprising a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof, during said recycling.

Claim 106 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest a process of manufacturing an electronic part comprising a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof, during said manufacturing. Neither Floyd et al and Dolf et al show any electronic part.

Claim 115 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 38, wherein the vitrifiable material

is melted into a foamy glass. Neither Floyd et al and Dolf et al show foamy glass. Indeed, the slag of Floyd et al, which the Examiner relies on, is disclosed as essentially non-porous (column 6, line 57).

Claim 116 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 115, wherein the foamy glass has a density of approximately 0.5 to 2 g/cm³.

Accordingly, it is respectfully requested that this rejection be REVERSED.

IX. CONCLUSION

For the above reasons, it is respectfully requested that all the rejections still pending in the Final Office Action be REVERSED.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Norman F. Oblon
Attorney of Record
Registration No. 24,618

Harris A. Pitlick
Registration No. 38,779



22850

(703) 413-3000
Fax #: (703)413-2220
NFO:HAP:

I:\atty\HAP\12470822-ab.wpd

APPENDIX

CLAIMS ON APPEAL

38. Process of manufacturing glass from vitrifiable materials comprising a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof.

39. Process according to claim 38, wherein the combustible elements are selected from the group consisting of coal, composite materials comprising glass and plastic, and organic materials.

40. Process according to claim 38, wherein the vitrifiable materials contain composite materials comprising glass and metal.

42. Process according to claim 38, wherein the oxidizer gas comprises air, oxygen-enriched air, or oxygen.

43. Process according to claim 38, wherein the melting of the vitrifiable materials takes place in at least one melting chamber which is equipped with burners passing through its side walls or passing through the floor wall or suspended from the roof or from superstructures, or any combination of sidewalls, floor and roof, so that combustion regions of said burners or combustion gases develop in the mass of vitrifiable materials being melted.

44. Process according to claim 38, wherein the combustion regions created by combustion of the combustible mixture or gaseous products resulting from combustion of the combustible mixture convectively stir the vitrifiable materials.

45. Process according to claim 43, wherein the height of the mass of vitrifiable materials in the melting chamber and the height at which the combustion regions or gases resulting from the combustion develop, are adjusted so that the said gases remain within the mass of said vitrifiable materials.

46. Process according to claim 38, wherein the melting is preceded by a step of preheating the vitrifiable materials to at most 900°C.

50. Process according to claim 38, wherein the melting is carried out at 1400°C at most.

56. Process according to claim 43, wherein all or some of the vitrifiable materials are introduced into the melting chamber below the level of the mass of vitrifiable materials being melted.

77. Process according to claim 39, wherein the combustible elements are composite materials comprising glass and plastic, and which are laminated glazing or mineral fibers with organic binders.

78. Process according to claim 40, wherein the composite materials comprising glass and metal are at least one of glazing with metallic coating, glazing with enamel coating, and glazing with electrical connecting means.

98. A product obtained by the process of claim 38.

100. The process according to claim 38, comprising additional steps, whereby said glass is manufactured.

101. The process according to claim 100, wherein the glass is flat glass.

102. The process according to claim 101, wherein the flat glass has a residual blue color and a solar-protection or fire-resistance function.

103. The process according to claim 100, wherein the glass is in the form of a bottle or a flask.

104. The process according to claim 100, wherein the glass is glass wool or glass fiber.

105. A process of recycling metal/glass or plastic/glass composite materials comprising a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof, during said recycling.

106. A process of manufacturing an electronic part comprising a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof, during said manufacturing.

115. Process according to claim 38, wherein the vitrifiable material is melted into a foamy glass.

116. Process according to claim 115, wherein the foamy glass has a density of approximately 0.5 to 2 g/cm³.

1247-0822-0V PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
Pierre JEANVOINE ET AL : GROUP ART UNIT: 1731
SERIAL NO: 09/381,631 : EXAMINER: S. VINCENT
FILED: MARCH 1, 2000 :
CPA FILED: MAY 23, 2002 :
RCE PERFECTED: HERewith :
FOR: METHOD AND DEVICE FOR MELTING AND
REFINING MATERIALS CAPABLE OF
BEING VITRIFIED

APPEAL BRIEF

COMMISSIONER FOR PATENTS
ALEXANDRIA, VA 22313

SIR:

This is an appeal of the Final Rejection dated January 9, 2003 of Claims 38-40, 42-46, 50, 56, 77, 78, 98, 100-106, 115 and 116. A Notice of Appeal, along with a petition for a third-month extension of time, is **submitted herewith**.¹

¹An RCE was attempted to be filed on June 5, 2003, accompanied with a two-month extension of time, for consideration of an IDS filed therewith. On June 28, 2003, the Office entered a Notice of Improper Request for Continued Examination (RCE), on the ground that the RCE was not accompanied by a submission as required by 37 CFR 1.114. This Appeal Brief is intended to constitute such submission. A copy of the Notice, as required therein, is **submitted herewith**.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Saint-Gobain Vitrage having an address at 18, Avenue 'Alsace, Courbevoise, France F-92400.

II. RELATED APPEALS AND INTERFERENCES

Appellants, Appellants' legal representative and the assignee are aware of no appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF THE CLAIMS

Claims 38-40, 42-46, 50, 56, 77, 78, 98, 100-106, 115 and 116 stand rejected and are herein appealed. Claims 41, 47-49, 51-55, 57-76, 79-97, 99, and 107-114 the remaining claims in the application, stand withdrawn as being directed to a non-elected invention.

IV. STATUS OF THE AMENDMENTS

No amendment under 37 CFR 1.116 has been filed.

V. SUMMARY OF THE INVENTION

As recited in independent Claim 38, the present invention is a process of manufacturing glass from vitrifiable materials comprising a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise

liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof.

See the specification at page 2, line 30 through page 3, line 3; and page 9, lines 25-27.

VI. ISSUES

Whether Claims 38-40, 42-46, 50, 56, 77, 78, 98, 100-106, 115 and 116 are unpatentable under 35 U.S.C. §103(a) over U.S. 5,615,626 (Floyd et al) in view of U.S. 3,260,587 (Dolf et al)?

VII. GROUPING OF THE CLAIMS

Claims 43-46, 50, 56, 77, 78, 98, 100-106, 115 and 116 each stand or fall separately from Claim 38.

VIII. ARGUMENT

Claims 38-40, 42-46, 50, 56, 77, 78, 98, 100-106, 115 and 116 stand rejected under 35 U.S.C. §103(a) as unpatentable over Floyd et al in view of Dolf et al. That rejection is untenable and should not be sustained.

As recited in active Claim 38, the present invention is a process of manufacturing glass from vitrifiable materials comprising a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise

liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof.

The choice made according to Claim 38 is very advantageous for the whole glass industry. It makes it possible to feed the melting furnace with at least partly organic materials and glass/organic composite materials that were hard to recycle (like windshields or mineral wool with organic binder). This is possible only because the burners are submerged ones. Only those particular burners make it possible to bring the combustibles at their vicinity, below the bath of molten glass. Furthermore, as explained in the specification, the submerged burners generate a lot of convection movements within the bath of molten glass, which makes the permanent renewal of the combustible elements at their vicinity possible. This is very innovating and could not have been imagined with conventional melting furnaces (either those using immersed electrodes and called electrical furnaces or those using burners above the bath of molten glass and sometimes called gas furnaces). This is a completely new use of the technology of the submerged burners (recycling/valorization of composite/waste materials), which renders it more attractive.

Floyd et al disclose a process for disposal of waste materials, including municipal waste such as garbage, industrial wastes, waste materials including rubber and plastics-based materials, and ash waste from municipal waste incinerators and toxic waste incinerators, wherein the waste is charged to a reactor of a top-submerged lancing injector reactor system, containing a molten slag bath maintained in a turbulent condition during charging of the waste by top-submerged injection therein of a free-oxygen containing gas, using at least one top-submerged lance of the system. The waste is taken into the molten bath and is caused to circulate therein to a combustion/oxidation zone generated by the top-submerged injection. Constituents of the waste are subjected to free-oxygen of the injected gas in that zone and to

heat energy of the slag, and thereby combusted/oxidized and/or decomposed. See the Abstract thereof. In addition, Floyd et al disclose that while the waste is being combusted in the reactor, the slag may be maintained at a temperature of from about 1100°C to 1800°C (column 3, lines 34-36 and column 6, lines 3-10). Floyd et al disclose further that rather than simply producing an ash residue as in existing processes, the process of their invention forms a slag product which, being a glassy phase, essentially encapsulates any ash produced and retains in solid solution any heavy metals which are not able to form a fume (column 7, lines 44-48). As disclosed at column 10, lines 45-48, Floyd et al is concerned with substantially complete combustion/oxidation of waste charged to their reactor.

Floyd et al neither disclose nor suggest the presently-claimed invention. The slag of Floyd et al acts, in essence, as a vehicle for the substantially completely combusted/oxidized waste therein. In the presently-claimed invention, while some combustion necessarily may occur due to the presence of combustible elements, nevertheless, the most-desired components of the vitrifiable materials, such as glass, are melted, not combusted. Floyd et al's apparatus is essentially an incinerator, not a melting chamber. One of Appellants' main goals herein is the ability to recycle vitrifiable materials such as glazings. Clearly, such recycle could not be achieved with the process of Floyd et al.

The Examiner finds that Floyd et al's municipal waste would include various "glazings." In reply, municipal waste would include just about anything, but since glass materials are not even listed in Floyd et al, Floyd et al contemplates relatively small amounts thereof at best. One skilled in the art would not look to Floyd et al to solve a problem regarding recovering vitrifiable materials, such as glazings.

Dolf et al is relied on for a disclosure of submerged combustion methods and apparatus. Particularly, the Examiner relies on the disclosure in Dolf et al of a glass melting

furnace with submerged gas burners, as a reason for why one skilled in the art would use the process of Floyd et al to produce a glass product. Dolf et al does not remedy the above-discussed deficiencies in Floyd et al.

Indeed, it is not clear why one skilled in the art would combine Floyd et al and Dolf et al. As discussed above, Floyd et al require that their waste be at least substantially completely combusted/oxidized. Melting the vitrifiable waste in Floyd et al without substantially completely combusting/oxidizing it, would frustrate Floyd et al's goals. In addition, the result would be Floyd et al's molten slag with molten vitrifiable materials of the waste. It is not clear that this product would have any value in producing recycled vitrifiable waste therefrom. Indeed, the final slag has a very small volume compared to the total mass of waste treated (column 8, lines 42-44). Figure 1 of Floyd et al shows that the treated mass is very porous and that gases easily circulate throughout the treated mass; the slag contains encapsulated ash and its state is not well-defined. Clearly, one skilled in the art interested in manufacturing glass would not carry out Floyd et al as any of the steps.

In the Final Office Action, the Examiner ignores most of the above arguments, and responds to only those which he believes support his case. None do.

At paragraph 12 thereof, the Examiner finds that Floyd et al discloses "slag or flux constitute vitrifiable materials," pointing to column 6, lines 50-60, and the table in column 13 thereof.

In reply, the above-disclosure in Floyd et al regarding slag does not rebut any of Appellants' arguments. Appellants have already acknowledged that Floyd et al discloses their slag product as a "glassy phase." But the only use for this product disclosed by Floyd et al is as a building material or for disposal for landfill (column 6, lines 58-60; column 13, lines 18-

22). That slag is a “glassy” byproduct is not suggestive of anything with regard to manufacturing glass.

Nor does Floyd et al pertain to glass recycling, as the Examiner suggests in paragraph 13 of the Final Office Action, and as rebutted by the above-discussed passage from Floyd et al with regard to building materials and landfills. The only disclosure of recycle in Floyd et al is “at least some slag can be recycled to the reactor as low-energy feed stock for controlling the bath temperature” (column 6, lines 55-56), clearly not something one would recycle glass for.

Regarding the Examiner’s response at paragraph 14 of the Final Office Action to Appellants’ arguments that there is no suggestion or motivation to combine Floyd et al and Dolf et al, the Examiner finds that their respective methods are “almost identical,” and that it would have been obvious to combine them because “[Dolf et al] taught that [Floyd et al’s] process had the ability to produce glass products. In the alternative, it would have also been obvious to combine [Floyd et al] with [Dolf et al] because [Floyd et al] taught that combustible matter in the feed materials would have acted as extra fuel for the melting of the non-combustible matter.”

In reply, Dolf et al is more than thirty years older than Floyd et al, so Dolf et al could not have taught anything about Floyd et al’s process. Secondly, Dolf et al is concerned with the ability to melt glass in large quantities in a relatively small area, in order to produce glass that is free from seeds and bubbles (column 1, line 10ff). Dolf et al’s goal is to ensure that all of the ingredients will be melted before they reach the fining tank, thus contributing to its life (column 3, lines 31-35). Again, without the present disclosure as a guide, it is not clear why one skilled in the art would combine a process for disposing municipal and industrial wastes with a process for melting glass.

In response to Appellants' argument that Floyd et al is not concerned with melting waste, the Examiner, at paragraph 15 of the Final Office Action, notes Floyd et al's disclosure at column 8, lines 6-25 that some of the waste is combusted or "simply dissolved into the slag bath."

In reply, the disclosure in Floyd et al at column 8, lines 6-25, relied on by the Examiner, relates to other particulate fillers present in rubber and plastics material that are "depending on their composition, simply dissolved in the slag bath." However, Floyd et al discloses nothing else with regard to such other particulate fillers. Indeed, Floyd et al seems most concerned about those fillers that combust (column 2, lines 52-64). At any rate, Floyd et al's ultimate goal is substantially complete combustion or oxidation, not melting, as pointed out above.

The Examiner has not considered any of the dependent claims separately. Some are separately patentable, as listed above, for the following reasons.

Claim 43 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 38, wherein the melting of the vitrifiable materials takes place in at least one melting chamber which is equipped with burners passing through its side walls or passing through the floor wall or suspended from the roof or from superstructures, or any combination of sidewalls, floor and roof, so that combustion regions of said burners or combustion gases develop in the mass of vitrifiable materials being melted. Neither Floyd et al and Dolf et al show such an arrangement.

Claim 44 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 38, wherein the combustion regions created by combustion of the combustible mixture or gaseous products resulting from

combustion of the combustible mixture convectively stir the vitrifiable materials. Neither Floyd et al and Dolf et al show such convection.

Claim 45 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 43, wherein the height of the mass of vitrifiable materials in the melting chamber and the height at which the combustion regions or gases resulting from the combustion develop, are adjusted so that the said gases remain within the mass of said vitrifiable materials. Neither Floyd et al and Dolf et al show such arrangement, especially such adjustment.

Claim 46 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 38, wherein the melting is preceded by a step of preheating the vitrifiable materials to at most 900°C. Neither Floyd et al and Dolf et al show no such preheating.

Claim 50 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 38, wherein the melting is carried out at 1400°C at most. Neither Floyd et al and Dolf et al show maintaining melting at or below this temperature.

Claim 56 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 43, wherein all or some of the vitrifiable materials are introduced into the melting chamber below the level of the mass of vitrifiable materials being melted. Neither Floyd et al and Dolf et al show such introduction.

Claim 77 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 39, wherein the combustible elements are composite materials comprising glass and plastic, and which are laminated

glazing or mineral fibers with organic binders. Neither Floyd et al and Dolf et al show such materials.

Claim 78 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 40, wherein the composite materials comprising glass and metal are at least one of glazing with metallic coating, glazing with enamel coating, and glazing with electrical connecting means. Neither Floyd et al and Dolf et al show such materials.

Claim 98 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the product obtained by the process of claim 38. Neither Floyd et al and Dolf et al show such a product.

Claim 100 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 38, comprising additional steps, whereby said glass is manufactured. Neither Floyd et al and Dolf et al show additional steps.

Claim 101 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 100, wherein the glass is flat glass. Neither Floyd et al and Dolf et al show such glass.

Claim 102 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 101, wherein the flat glass has a residual blue color and a solar-protection or fire-resistance function. Neither Floyd et al and Dolf et al show such glass.

Claim 103 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 100, wherein the glass is in the form of a bottle or a flask. Neither Floyd et al and Dolf et al show such glass.

Claim 104 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 100, wherein the glass is glass wool or glass fiber. Neither Floyd et al and Dolf et al show such glass.

Claim 105 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest a process of recycling metal/glass or plastic/glass composite materials comprising a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof, during said recycling.

Claim 106 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest a process of manufacturing an electronic part comprising a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof, during said manufacturing. Neither Floyd et al and Dolf et al show any electronic part.

Claim 115 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 38, wherein the vitrifiable material

is melted into a foamy glass. Neither Floyd et al and Dolf et al show foamy glass. Indeed, the slag of Floyd et al, which the Examiner relies on, is disclosed as essentially non-porous (column 6, line 57).

Claim 116 is separately patentable, because the combination of Floyd et al and Dolf et al neither disclose nor suggest the subject matter of Claim 115, wherein the foamy glass has a density of approximately 0.5 to 2 g/cm³.

Accordingly, it is respectfully requested that this rejection be REVERSED.

IX. CONCLUSION

For the above reasons, it is respectfully requested that all the rejections still pending in the Final Office Action be REVERSED.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Norman F. Oblon
Attorney of Record
Registration No. 24,618

Harris A. Pitlick
Registration No. 38,779



22850

(703) 413-3000
Fax #: (703)413-2220
NFO:HAP:

I:\atty\HAP\12470822-ab.wpd

APPENDIX

CLAIMS ON APPEAL

38. Process of manufacturing glass from vitrifiable materials comprising a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof.

39. Process according to claim 38, wherein the combustible elements are selected from the group consisting of coal, composite materials comprising glass and plastic, and organic materials.

40. Process according to claim 38, wherein the vitrifiable materials contain composite materials comprising glass and metal.

42. Process according to claim 38, wherein the oxidizer gas comprises air, oxygen-enriched air, or oxygen.

43. Process according to claim 38, wherein the melting of the vitrifiable materials takes place in at least one melting chamber which is equipped with burners passing through its side walls or passing through the floor wall or suspended from the roof or from superstructures, or any combination of sidewalls, floor and roof, so that combustion regions of said burners or combustion gases develop in the mass of vitrifiable materials being melted.

44. Process according to claim 38, wherein the combustion regions created by combustion of the combustible mixture or gaseous products resulting from combustion of the combustible mixture convectively stir the vitrifiable materials.

45. Process according to claim 43, wherein the height of the mass of vitrifiable materials in the melting chamber and the height at which the combustion regions or gases resulting from the combustion develop, are adjusted so that the said gases remain within the mass of said vitrifiable materials.

46. Process according to claim 38, wherein the melting is preceded by a step of preheating the vitrifiable materials to at most 900°C.

50. Process according to claim 38, wherein the melting is carried out at 1400°C at most.

56. Process according to claim 43, wherein all or some of the vitrifiable materials are introduced into the melting chamber below the level of the mass of vitrifiable materials being melted.

77. Process according to claim 39, wherein the combustible elements are composite materials comprising glass and plastic, and which are laminated glazing or mineral fibers with organic binders.

78. Process according to claim 40, wherein the composite materials comprising glass and metal are at least one of glazing with metallic coating, glazing with enamel coating, and glazing with electrical connecting means.

98. A product obtained by the process of claim 38.

100. The process according to claim 38, comprising additional steps, whereby said glass is manufactured.

101. The process according to claim 100, wherein the glass is flat glass.

102. The process according to claim 101, wherein the flat glass has a residual blue color and a solar-protection or fire-resistance function.

103. The process according to claim 100, wherein the glass is in the form of a bottle or a flask.

104. The process according to claim 100, wherein the glass is glass wool or glass fiber.

105. A process of recycling metal/glass or plastic/glass composite materials comprising a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof, during said recycling.

106. A process of manufacturing an electronic part comprising a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof, during said manufacturing.

115. Process according to claim 38, wherein the vitrifiable material is melted into a foamy glass.

116. Process according to claim 115, wherein the foamy glass has a density of approximately 0.5 to 2 g/cm³.